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Sustainable Service-Learning Projects in the Tropics: A Costa Rica Maymester

Cover Page Footnote

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SUSTAINABLE SERVICE-LEARNING PROJECTS IN THE TROPICS:

A Costa Rica Maymester

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ABSTRACT

International service-learning projects extend textbook knowledge into practical, real-world applications while giving students an opportunity to engage in a different culture. In May 2012, a group of Purdue students from various majors in the College of Agriculture, led by a student leader and faculty member, traveled to Costa Rica to complete several service-learning projects. These projects included: (1) the construction and installation of water filtration systems, (2) creating an animal health care curricula for local schools, and (3) finalizing a guidebook of flora and fauna to benefit an emerging ecotourism site. Maymester students met for an 8-week course prior to traveling that allowed for planning and preparation of the projects. The student leader and faculty member wrote and won grants to aid in the funding of the water filtration project as well as the animal health care project. All of these service-learning projects were a result of collaboration with Costa Rican community leaders to determine areas in their community that could use improvement. One of the key elements in service-learning is the concept of reciprocity. While the Maymester students provided a service to aid the Costa Rican communities, they also gained knowledge on cross-cultural collaboration and communication. Students generally reported feeling grateful for the opportunity to help a community and valued the learning process that came from working in another country.

INTRODUCTION

Service-learning projects are developed to address the needs of communities and to promote awareness of social

issues while providing educational enhancement to the students involved. It is vital in today's increasing global mindset that students learn to solve real world problems at the international level, whether through study abroad experiences or in the classroom. Programs that combine service-learning with studying abroad engage students in responding to social issues in a creative manner (Durham, Unruh Snyder, & Brewer, 2011). Sustainable service-learning projects incorporate reciprocity and risk taking (Cushman, 2002). Initiatives can better be sustained when the community is viewed as a place where research, teaching, and service all contribute to the community's needs and the students' learning (Cushman, 2002).

A group of 12 Purdue University students participated in a 2012 Maymester study abroad course in Costa Rica that aimed at developing and implementing several service-learning projects. The students met for an 8-week course prior to departing for Costa Rica to prepare for the work to be done abroad. A faculty member and student leader encouraged discussion during these meetings to ensure maximum preparedness. For example, the design of the water filtration system was the topic of one meeting. The Maymester students debated the best way to design a filtration system that would use local materials and be effective at reducing contamination. Another class meeting topic was the tour guidebook and how to document flora and fauna. In addition to meeting and designing the service-learning projects, the students gained experience in grant writing. For the water quality project and animal health care project, three students, including the student leader, wrote and won grants from the Purdue Provost's Office and various academic departments.

Two Costa Rican communities (Pangola and Iroquois) expressed concern over social issues, such as water quality and animal health care, forming the basis of the Maymester service-learning projects. The Iroquois community is located outside of Guácimo, Costa Rica, near Escuela de Agricultura de la Región Tropical Húmeda (EARTH) University. The students collaborated with La Asociación de Desarrollo Integral Iroquois (The Iroquois Association for Integral Development) to complete the water quality and animal health care projects. The goal of this organization is to promote community-wide projects. Purdue faculty and students have been involved with this organization for several years. The second community, Pangola, is located near the Nicaraguan border, about three hours north of San Jose. It is a fairly isolated community of roughly 30–40 households. Recently, a new ecotourism business, Cinco Ceibas, opened, and this will bring many visitors to this once isolated community. In this community, there is no association or organization; therefore, the students went from household to household to work on the project. The guidebook service-learning project took place at the ecotourism site of Cinco Ceibas rather than in a community, the water quality project took place in both Iroquois and Pangola, while the animal health care project took place only in Iroquois. The location of the projects was determined by the needs of the specific communities.

Design and Implementation of the Water Quality Project

The students developed the following task objectives for the water quality project: (1) survey the Iroquois and Pangola community members, (2) take water samples at each surveyed home, (3) construct water filtration systems to distribute, (4) conduct a water sanitation education workshop, and (5) give a demonstration of water testing methods in the local elementary school. Over 140 households were surveyed with regards to their water quality and sanitation education level. Water samples were collected and tested for copper/nitrate/nitrite, coliform bacteria, and pH. Twenty-three Costa Rican households were directly impacted as a result of this project by receiving a water filtration system. These households were determined to be the most in need of purified potable water based on the survey results.

For the construction of the filtration systems, the goal was to use as many locally available materials as possible (Figure 1). The design for the water filtration system was proposed by one student and modified by the

others during the 8-week course. To enhance the quality of the drinking water, slow sand filtration systems (also known as bio-sand filters) were constructed by the students. Slow sand filtration systems are fairly easy to construct since they are made of locally available materials. The bio-sand filters required no maintenance costs and were accessible to any communities with a supply of sand. It was estimated that 500,000 people in developing countries worldwide use bio-sand filters for their drinking water, and it has been proven to be effective in reducing bacteria numbers, particularly *E. coli*, in drinking water (Elliott et al., 2008). This type of filtration system uses plastic buckets filled with a layer of sand (approximately 45–50 cm) to filter out contaminants (Jenkins et al., 2011).



Figure 1. Maymester students were involved in obtaining the necessary materials and constructing the water filtration systems. A slow sand filtration system was used as it required materials that could be found locally. Students worked in assembly line fashion to drill the pipes, sieve the sand, and wash the sand. (Photo credit: Kimberly Lutz)

To better serve the needs of the Iroquois community, a water quality seminar was held after the water sampling was completed (Figure 2). A presentation was developed to address topics like waterborne diseases and how to prevent such diseases. The presentation engaged the community in learning about water quality issues. The presentation was replicated in local elementary schools but modified to fit the science curricula needs. The Maymester students brought along water quality test kits allowing the elementary school students to use them and be “scientists” for the day.



Figure 2. A water quality workshop was held at the health center in the Iroquois community to educate and create awareness surrounding water-borne diseases and water pollutants. Community members were encouraged to participate and ask questions. PowerPoint presentation slides described diseases and contaminants and provided images to supplement the information given. (Photo credit: Dr. Lori Unruh Snyder)

Design and Implementation of the Animal Health care Project

After discussions with the La Asociacion de Desarrollo Integral Iroquois and the principal of the local elementary school, it was determined that two classrooms would benefit most from animal health care lesson plans. The Maymester students created interactive presentations for a kindergarten classroom and a fourth/fifth grade classroom. Two storybooks (in Spanish) were read to break the ice among the college students and the elementary school students. These books were *El Perro Vagabundo* (*The Stray Dog*) and *Diez Perritos* (*Ten Puppies*). Then, a printed copy of a PowerPoint presentation addressed topics such as veterinary care and supplies pets need.

At the end of the presentation, coloring worksheets adapted from the American Society for the Prevention of Cruelty to Animals's (ASPCA) humane education program were distributed (Figure 3). The kids were asked to color the supplies they thought a pet needed. At the very end of the lesson, the elementary school students were engaged in a question and answer session to gauge knowledge retention of the information taught. Participation was encouraged by giving out small prizes (i.e., school supplies) as an incentive to answer questions.



Figure 3. As a part of the animal health care presentation in the Iroquois Elementary School, students were asked to complete a coloring worksheet with items they believed a pet needed. All worksheets were adapted from the ASPCA's humane education materials. (Photo credit: Kimberly Lutz)

Design and Implementation of the Guidebook Project

The guidebook creation stemmed from the needs of a primary rainforest ecotourism site to document their flora and fauna for educating the public. The Maymester students were involved in the revising of previously documented species, as well as involved in the documentation of newly located species. The objective was to demonstrate the documentation process and the importance of such documentation.

Students were asked to do a plant inventory along a one mile long boardwalk in the rainforest. They cataloged species of flora and fauna that would be of interest to the public and researched these species. The cataloging included taking pictures and videos of the species which were most relevant to the guidebook. They were also asked to measure the large ceiba trees found along the boardwalk, which involved calculations and creativity as they could not be measured by conventional methods (Figure 4). Collaboratively, the students and faculty selected 40 plants to create the final guidebook.

RESULTS AND IMPACTS

Based on undergraduate student evaluations of this experience, the following were answered on a Likert scale where 1 indicated "Strongly Disagree" and 5 indicated "Strongly Agree." A total of 15 students responded to the following questions over a two-year span:



Figure 4. Students assisted in measuring this ceiba tree, the largest one in Cinco Ceibas, in the primary rainforest as a part of creating the tour guidebook. (Photo credit: Kimberly Lutz)

- Learning was more meaningful in this class than other classes I have taken = 4.1;
- I took more responsibility for my learning in this class than I typically do in other classes = 4.0;
- The community service was relevant to the academic course materials and content = 4.2;
- I was more motivated to learn in this class than in other classes I have taken = 4.2;
- I felt my contributions were appreciated by the community partner = 4.6;
- The instructor should use the community partner we worked with for future service-learning projects= 4.4.

The students reported that “people really appreciated our service and it was apparent.” In addition, a student reported that the “service-learning project really helped improve my language skills and got me out of my comfort zone in a positive way.” Another stated, “The

people of this community have truly impacted my life, and my time with them has truly taught me the most during this trip.” From the professional development aspect, students commented that “key components were: time management, people management/organization-delegation of tasks, full responsibility for seeing through a project”; “Yes, I do. I believe that employers would like that I grew through culture immersion because it shows that I can adapt to different environments”; “Also this service-learning experience shows that I’m not afraid of challenges and am always willing to try something out of my comfort zone”; and “I think the overall experience of going abroad will help me add value.”

From the community side, there were 23 households totaling 115 people that were directly impacted by the project as recipients of the water filtration systems. Students participated in reflection sessions at various points during the 3-week trip to discuss their feelings and experiences related to the service-learning projects and Costa Rica. Discussions are necessary for the learning and growing process. Discussions with other students are opportunities to learn from others, inform the group of their views, and to have their personal opinions challenged (Trosset, 1998).

The general consensus was that the students felt good about giving back to the communities and felt receptive to learning. Students noted that their cross-cultural communication skills were honed as a result of working on these projects. They had to work in conjunction with Costa Ricans to accomplish certain tasks, such as construction and delivery of the water filtration systems. Based on reflections provided by the water project, the following student statement was made: “It was great to be immersed in the culture and to be able to help the kids.” Based on the reflections of the guidebook project, one student reflected on her experience: “We were able to contribute to the process by measuring trees that would be incorporated into the booklet which enabled me to appreciate my math and physics courses.” Another student made a comment about how they connected to the community: “Looking back on my trip, this experience was one of the best for me because I had the opportunity to interact with locals and gain insight on how they valued the project.”

Reciprocity is one of the key components of a service-learning project, and the Maymester students reported that they felt moved by being helpful to the community, particularly with the distribution of the water filtration system. For those who did not speak Spanish, they found it easier to work with the elementary school students since children are more accepting of the language barrier.

The community expressed gratitude that the students took the time to get to know them and help with community-wide issues (Figure 5).

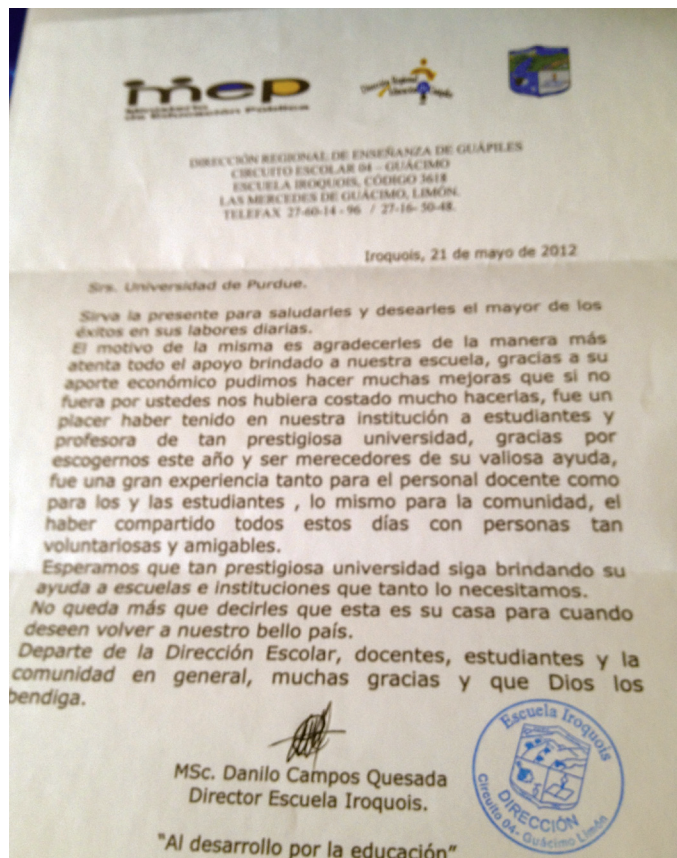


Figure 5. The community fully supported all of the service-learning projects as evidenced by this letter from the Iroquois Elementary School principal. (Photo credit: Kimberly Lutz)

SUMMARY AND CONCLUSIONS

Combining both the skill set of the 2012 Maymester students and the needs of several Costa Rican communities led to the completion of several service-learning projects. The primary implication of this service-learning-based study abroad course is the impact service-learning projects can have on developing global perspectives and cross-cultural communication skills. Students suggested several improvements that could be made overall for the course, including spending more time in the Costa Rican elementary schools conducting science lessons (as this seemed to be an ongoing need in the communities). With the help of the Maymester students and Costa Rican community members, these service-learning projects were a success, and they pave the way for future work in similar locations.

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